A SIMPLE COOLER FOR USE WITH THE MICROTOME.

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The microtomist's ability to prepare thin paraffin sections, depends, among other things, on the hardness of his imbedding medium, and this, in turn, on the temperature of the laboratory. Usually this circumstance offers no insurmountable difficulties, but there are times and places when this is not true. To meet such conditions several devices have been suggested and used by various investigators, but we know of none so simple, or as little likely to make difficulties, as the one about to be described.

The apparatus, which is shown, set up for action, in Fig. 1, is essentially a hollow truncated pyramid, open at both ends, and suspended in an inverted position from a standard, so adjusted that the lower end of the shoot is at a convenient distance above the knife. At the upper end of the inverted pyramid, and surrounded by it, is a tray whose dimensions are less than those of the base of the shoot. This tray is filled with crushed ice, and from one corner of it a drain leads the water to the escape from the lower end of the air-channel. At that point a rubber tube connects the pipe with a suitable receptacle.

The cooler is easily set up, interferes in nowise with the operator, and is thoroughly effective. When the air of the room strikes the melting ice in the tray, it is chilled and immediately falls between the tray and the walls of the pyramid. In this way a constant stream of cold air pours from the lower end of the shoot, and as this may be placed directly above the paraffin-block and knife-edge, both of these are cooled, and make it possible to cut sections very much thinner than the unmodified temperature of the room would allow.

The extent to which it is desirable to cool the paraffin and knife varies with each specific case, but the cooler is adjustable in at least two ways. In the first place the distance of the block from the end of the shoot can be changed within comparatively wide limits; in the second place the temperature of the air de-

livered may be further lowered by the addition of NaCl to the ice. Other salts can be used should a greater depression of the temperature be necessary.

The following table is the record of a test made at a room temperature of 87.8°F. The material in this particular case could

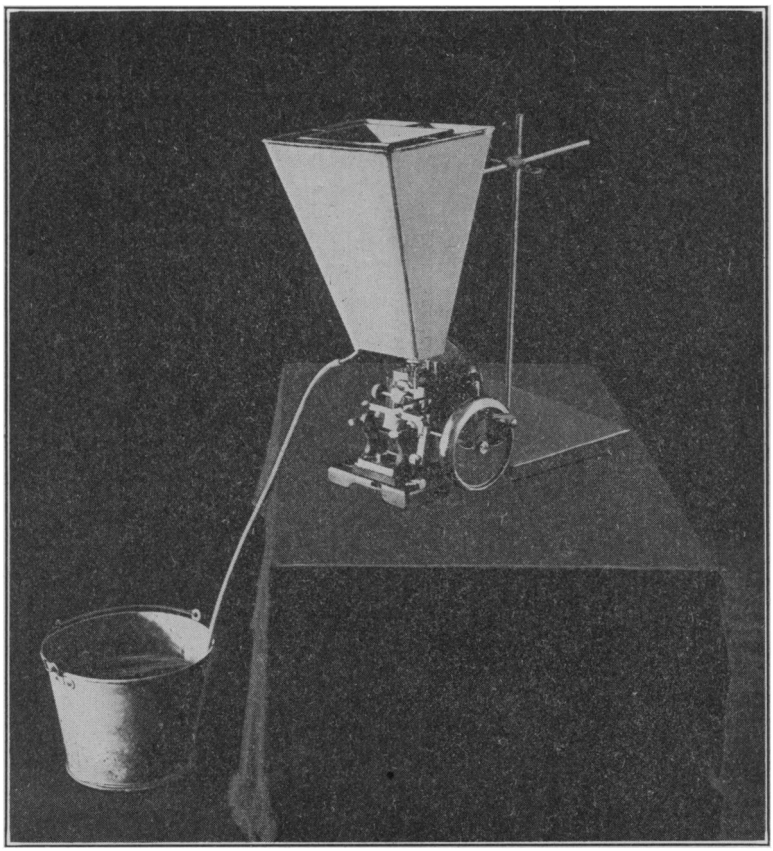

FIG. 1. Photograph of Cooler, by Miss Francis J. Dunbar. Measurements of pyramid : base, 12.5 in. x 8.7 in.; truncated apex, 6.1 in. x 2.1 in. Measurements of Ice-tray : 8.8 in. x 3.3 in. Cost, $3.50 without the standard.

not be imbedded in paraffin with high melting-point and satisfactory sections, even as thick as 12 micra, could not be cut. With the aid of the cooler however, a perfect series, 3 micra in thickness, was easily prepared from the same block of 45–48° paraffin.

TEST OF COOLER.

Room temperature .....31°C....87.8° F

Contents of Tray.	Distance below Mouth of Shoot.		
Crushed ice	6 cm.	24.5	76.1
Crushed ice + NaCl	6 "	23	73.4
Crushed ice	3 "	18	64.4
Crushed ice + NaCl	3 "	17	62.6

Several coolers, varying somewhat in size, but all modeled after our original one at Johns Hopkins University, are now in use in different laboratories. The measurements given in connection with Fig. 1, are those of the cooler at the University of Michigan. This particular one does not have the advantage of a removable ice-pan. In general, size is of little consequence unless it involves too great a reduction in the capacity of the ice-tray, or is conducive to too much absorption of heat by the sides of the pyramid. This latter difficulty is easily overcome by lining the shoot with asbestos paper.

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